

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) **30 MAY 2005 (30.05.2005)**

Applicant's or agent's file reference
M04-1019-PCT

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/KR2005/000485

International filing date (day/month/year)

23 FEBRUARY 2005 (23.02.2005)

Priority date(day/month/year)

11 MARCH 2004 (11.03.2004)

International Patent Classification (IPC) or both national classification and IPC

IPC7 B01D 63/08

Applicant

ENVIRONMENTAL VISION 21 LTD. et al

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR



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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/KR2005/000485

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2005/000485

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-30	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	1-30	YES
	Claims	NONE	NO
Industrial applicability (IA)	Claims	1-30	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following documents;

D1: US 4066546 A

D2: US 4176064 A

The present invention relates to a rotor for generating vortex water flow and a filtering apparatus employing the same, and more particularly, to a separation membrane filtering apparatus for filtering pollutant in water containing the pollutant material to obtain clean purified water, and a rotor for generating vortex water flow employed in the same.

D1 relates to a continuous filtering process and apparatus therefor in which a violent turbulence of fluid to be filtered is caused in a filter tank through which the fluid is continuously flowed. The turbulence is caused by rapidly rotating rotators which are arranged in the filter tank so that the surfaces of the rotators face the surfaces of filter media provided in hollow filter disks; D2 relates to a mixture concentrator usable for significantly increasing the amount of proppant in a formation-fracturing foam. In particular embodiment, the concentrator is composed of a substantially horizontally extending vessel, a rotor rotatably mounted inside the vessel on a shaft and a motor for rotating the shaft.

Though claim 1 of the present invention is the same as D1 and D2 in detaching the pollutant adhered to the surface of the separation membranes through vortex water flow generated by rotating rotors, the rotor of the present invention is inventive in including in a body both a plurality of first blades extended in a radial direction from a rotational axis thereof and a plurality of second blades extended in the radial direction from the rotational axis, and disposed at positions different from positions of the first blades in a direction of the rotational axis. Claims 2-25 defining the shapes and the method of combination of said blades of claim 1 are also inventive.

Claim 26 relates to a filtering apparatus including a barrel having a water inflow port, a processed water discharge port, and a condensed water discharge port; at least one of rotor disposed in the barrel and having a construction depicted in one of claims 1 through 25; and at least one of filter tray disposed alternately with the rotors in the barrel, using the rotor claimed in claims 1-25 of which the inventive step is acknowledged. Claims 27-30 dependent on claim 26 are also inventive. (PCT Article 33(2)-(3))

Claims 1-30 are industrially applicable. (PCT Article 33(4))